Reciprocal rule

The reciprocal rule is very similar to the quotient rule, except that it can only be used with quotients in which the numerator is a constant. Here is the formula:

Given a function

$$h(x) = \frac{a}{f(x)}$$

then its derivative is

$$h'(x) = -a\frac{f'(x)}{\left[f(x)\right]^2}$$

Given that the numerator is a constant and the denominator is any function, the derivative will be the negative constant, multiplied by the derivative of the denominator divided by the square of the denominator.

Example

Use reciprocal rule to find the derivative.

$$h(x) = \frac{1}{2x+1} + \frac{5}{3x-1}$$

Applying the reciprocal rule gives

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$$h'(x) = -\frac{2}{(2x+1)^2} - \frac{15}{(3x-1)^2}$$

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